Space Network Access System (SNAS)

System Requirements Review (SRR)

July 8, 2003

Agenda

☐ **Introduction**   **Joe Stevens**

☐ **System Description**   **Earl Bartlett**

☐ **Concept of Operations**   **Denise Gilliland**

☐ **Requirements**   **Trish Gravatt**

☐ **Security**   **Earl Bartlett**

☐ **Operations and Maintenance**   **Earl Bartlett**

☐ **Documentation**   **Earl Bartlett**

☐ **Product Implementation**   **Joe Stevens**

☐ **Closing Remarks**   **Joe Stevens**

Section 1
Introduction

Purpose
Review Board
Product Organization

☐ **Conduct an independent peer review of the SNAS System Requirements and Operations Concept.**
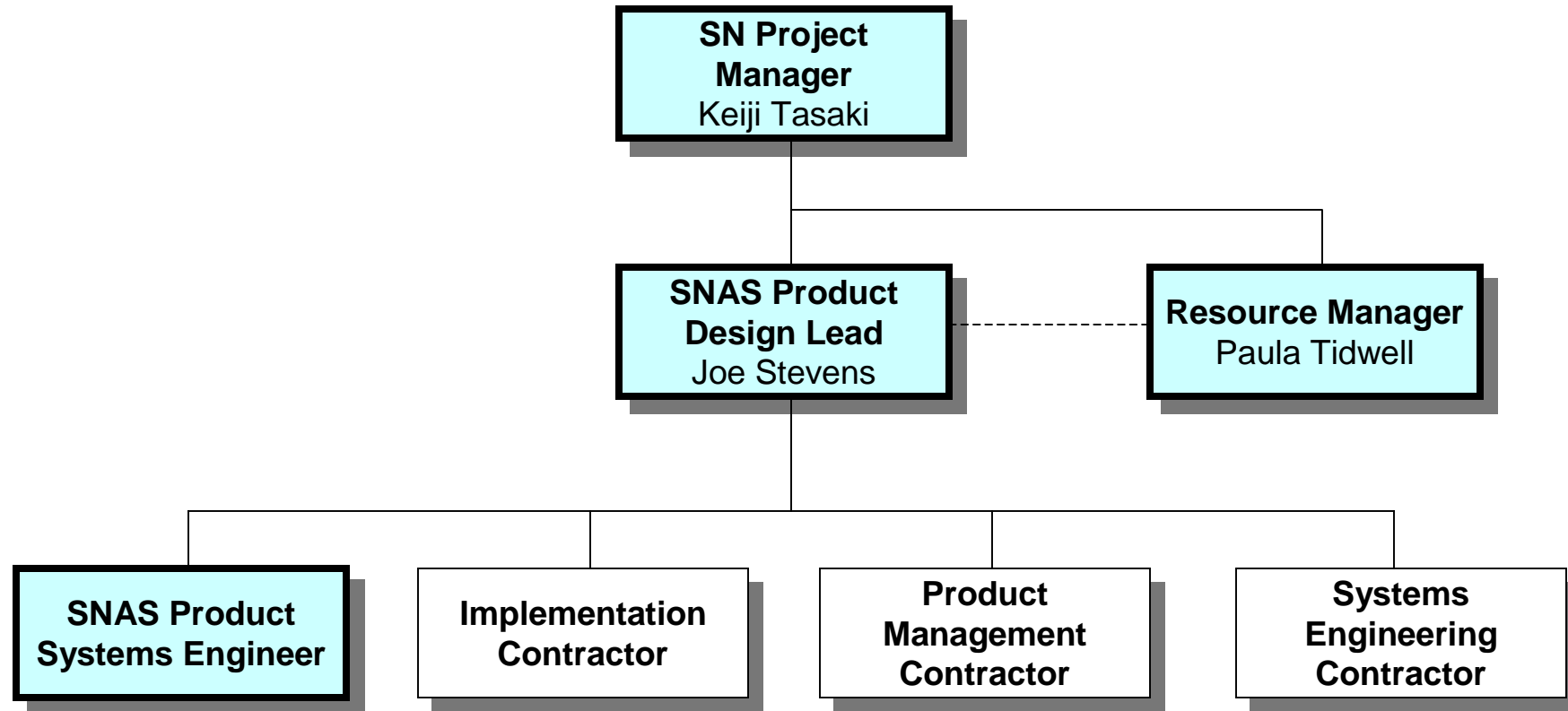
☐ **Caren Gioannini – Code 565 (Chair)**

☐ **Tom Gitlin – Code 452**

☐ **Lynn Myers – Code 451**

☐ **Steve Currier – Code 453**

☐ **David Campbell – Code 581 (HST)**

☐ **Bob Hudgins – DSMC Operations**

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Implementation Contractor

Product Management Contractor

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NASA

Contractor

Section 2
System Description

Purpose of SNAS
Existing Scheduling Systems
SNAS System Capabilities
SNAS Reference Architecture
Architecture Descriptions
SNAS Interfaces

Purpose of SNAS

☐ **The purpose of the SNAS is to provide a single customer interface for performing SN scheduling and real-time service monitoring and control that is:**

- Universally accessible
- Low-cost
- Standards-based

☐ **Current systems available to customers for scheduling:**

- User Planning System (UPS)
- SN Web Services Interface (SWSI)
- Customer-unique scheduling systems

☐ **SNAS will consolidate the functionalities of the UPS and SWSI into a single system, and will replace the UPS and SWSI as the primary scheduling interface between the SN customer and the SN.**

- Existing customers with unique SN interface systems will not be precluded from continuing to use their current systems.
- Customers currently using their own UPS may still continue to use it without SN-provided upgrades and maintenance.

Existing Scheduling Systems

☐ **The UPS provides a full-featured scheduling tool for SN customers; however:**

- New SN customers must purchase their own system (~$35K per system) or
- Purchase leased line (NISN Closed IONet) to connect to UPS in the Multisatellite Operations Control Center (MSOCC)
- UPS does not provide an interface to the SN Demand Access System (DAS).
- UPS does not offer real-time monitoring and controlling of SN services

☐ **SWSI offers a simple, low-cost, network-based, quick-turn around scheduling and real-time function for both DAS and Network Control Center Data System (NCCDS) customers; however, limits SN customers to a small number of advanced scheduling capabilities.**

☐ **Some SN customers use customer-unique scheduling systems that meet the requirements of 451-ICD-NCCDS/MOC, the NCCDS-Mission Operations Center (MOC) ICD; however, these systems can be expensive to maintain and the burden is on the customer to ensure constant compliance with 451-ICD-NCCDS/MOC.**

SNAS System Capabilities

- **Provide a network-based (server-client relationship) SN customer interface to the NCCDS and the DAS for scheduling and real-time service monitoring and control.**

- **Support all customer messages as defined in:**
    - 451-ICD-NCCDS/MOC, the ICD between the NCCDS and the Mission Operations Center (MOC)
    - 452-ICD-DAS/SNAS, the ICD between DAS and SNAS

- **Allow access from the NISN Closed IONet, the NISN Open IONet, and the public Internet.**

- **Provide for platform independence and easy system setup (The SNAS client may be run on any type of personal computer (PC) or workstation that can run Sun Microsystems Java Virtual Machine).**
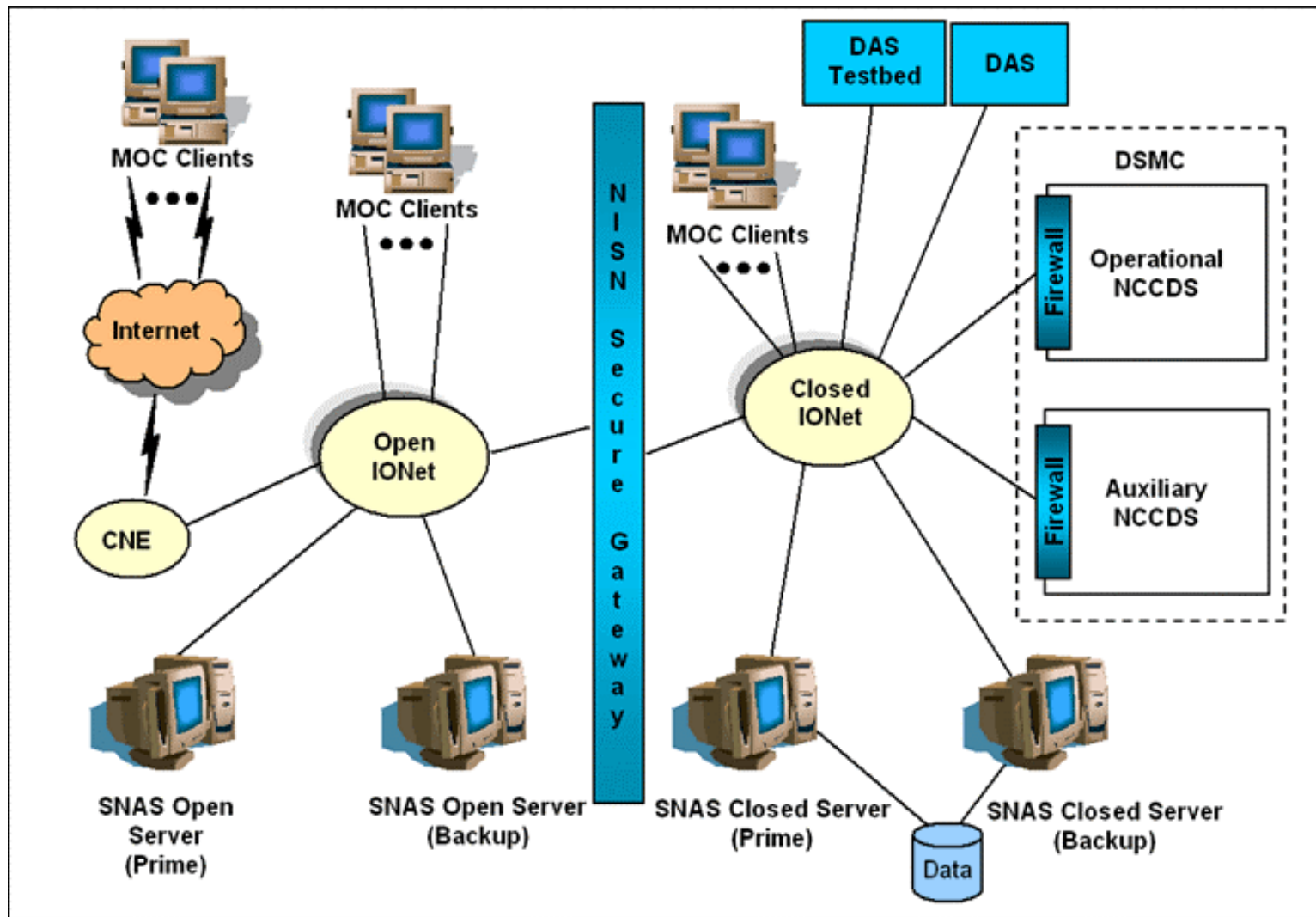
☐ **Client:**

- – Client software will reside on SN Customer MOC workstation or PC.
- – Provide access to the SN via the Open or Closed SNAS Servers.

☐ **Servers:**

- – Act as proxies to route requests from the client to the NCCDS and/or the DAS, and return responses to the client.
- – Establish and maintain all required Transmission Control Protocol (TCP) connections.

☐ **Database:**

- – Operate on the Closed IONet side of the NISN Secure Gateway.
- – Hold static data, semi-static data, and dynamically updated data.
- – SNAS customers will be granted access privileges depending upon their roles.

SNAS Interfaces

- **Customer MOC Client Workstation:**
  - SNAS Client software will reside on this workstation.
  - Workstation must be capable of accessing the Internet and/or IONet (Open or Closed), and running Sun Microsystems Java Virtual Machine.
  - Client will have one TCP interface to SNAS Servers.

- **IONet Secure Gateway:**
  - SNAS Open Server/Closed Server connection is through the IONet Secure Gateway.

- **Data Service Management Center (DSMC):**
  - Interface with the NCCDS for NCCDS operations.
  - Interface with the Auxiliary Network Control Center (ANCC) for NCCDS interface testing activities (also, the ANCC serves as the backup for NCCDS operations).

- **DAS:**
  - Interface with the DAS for DAS customer operations.
  - Interface with the DAS Testbed for DAS customer testing activities.

Section 3
Concept of Operations

Assumptions
NCCDS Operations
DAS Operations

Assumptions

☐ **The following assumptions are made regarding the SNAS operations concept:**

- The required coordination and planning between the SN customer and the Mission Services Program (MSP) Customer Commitment Office has occurred (e.g., establishment of a Project Level Service Agreement (PSLA), a RF Interface Control Document (ICD) is in place, etc.).

- The SN customer parameters required for NCCDS and/or DAS service support (e.g., Support Identification Code (SIC), etc.) have been established in the SNAS database prior to the SN service forecast scheduling period.

☐ **NCCDS Service Scheduling:**

– Forecast Scheduling:

- NCCDS forecast scheduling window is 2 to 3 weeks prior to the SN support.

- Customer submits requests for the week-long forecast period via SNAS.

- Forecast period service requests may be created individually or as a series in SNAS, or imported into SNAS from an external source.

- SNAS performs basic validation functions, such as data type validation and boundary checking, on the service requests.

- When forecast schedule request results are received from the NCCDS, SNAS updates the request status and notifies the customer.

☐ **NCCDS Service Scheduling (continued):**

– Active Scheduling:

- NCCDS active scheduling window is the following 2 weeks after the forecast period.

- Customer submits service requests (additions, deletions, replacements, etc.) for the 2-week long active period via SNAS.

- Active period service requests may be created individually or as a series in SNAS, or imported into SNAS from an external source.

- SNAS performs basic validation functions, such as data type validation and boundary checking, on the service requests.

- When active schedule request results are received from the NCCDS, SNAS updates the request status and notifies the customer.

□ **NCCDS Real-Time Operations and Performance Monitoring:**

- During the scheduled SN service event, customers may submit Ground Control Message Requests (e.g., a reconfiguration request, a reacquisition request, etc.) to the NCCDS via SNAS.

- Customers may monitor service performance via SNAS:

  - User performance data (UPD)

  - Return channel time delay

  - Time transfer

  - Acquisition failure notification

- NCCDS alerts are transmitted to the customer via SNAS.

- SNAS supports customer state vector management.

DAS Operations

□ **DAS Service Scheduling:**

- During service planning, the customer requests via SNAS a report from DAS on available Tracking and Data Relay Satellite (TDRS) view windows for this customer.

- The DAS response to the customer via SNAS lists the time windows when the customer platform is in view of TDRS(s) that are available for allocation to this customer.

- The customer then submits a request via SNAS for allocation of the SN resources required for the customer's DAS event.

- The DAS response (accepted, rejected, or pending) to the resource allocation request is provided to the customer via SNAS.

- The customer may modify a pending SN resource allocation, and/or delete a pending or ongoing resource allocation.

- Upon request, DAS provides to the customer via SNAS information on all planned DAS events and/or details of a planned event.

- The DAS scheduling window is 96 hours. Service requests beyond this window are stored in DAS until they enter the planning period.

DAS Operations (continued)

☐ **DAS Real-Time Operations and Performance Monitoring:**

– During the scheduled SN DAS service event, customers may submit reconfiguration requests and/or reacquisition requests to the DAS via SNAS.

– Customers may request and receive DAS service UPD messages via SNAS.

– DAS alerts are transmitted to the customer via SNAS.

– SNAS supports customer state vector management.

Section 4
Requirements

Methodology
System Functionality
Client Functionality
NCCDS Functionality
DAS Functionality
Database Functionality
Performance Requirements

- ☐ **Merged SWSI and UPS functional requirements into one document.**

- ☐ **Solicited scheduling and real-time operations requirement information from SN customers, and factored the customer needs/requests into the SNAS requirements.**
  - – Developed a customer survey and distributed it to 23 SN customer missions.
  - – Received feedback from 11 SN customer missions in the form of a completed survey and/or an interview with the customer.

- ☐ **Developed additional requirements enhancing the current capabilities of SWSI and UPS.**

- ☐ **SNAS implementation contractor will develop detailed subsystem requirements.**

System Functionality

☐ **Provide an automated SN interface for scheduling, real-time monitoring and real-time control during active events.**

☐ **Provide reporting capabilities including reports of requested events, confirmed active schedules, and activity logs.**

☐ **Ensure that customers are only able to access messages and data for which they are authorized.**

☐ **Provide the capability to create, update and display data in the system database.**

☐ **Support multiple local or remote connections to the NCCDS and DAS.**

☐ **Provide simultaneous access to both the operational NCCDS and the Auxiliary NCCDS for performing Engineering Interface (EIF) testing.**

☐ **Provide simultaneous access to both the operational DAS and the DAS Test Bed for performing EIF testing.**

☐ **Provide operation and maintenance of the system at multiple levels of access.**

□ **Support Data/File Transfer to/from NCCDS/DAS.**

□ **Provide a means to view alerts or messages when operational abnormalities are detected in SN Scheduling Function resources.**

□ **Provide Validation:**

- TDRS view/orbital constraint checking using TDRSS Scheduling Windows (TSWs)

- Parameter verification

☐ **Provide the capability to create the following types of schedule requests in an interactive, one-at-a-time mode:**

  – Schedule Add Request (SAR)

  – Schedule Delete Request (SDR)

  – Schedule Replace Request (RR)

  – Alternate SAR (ASAR)

  – Schedule Wait List Request (WLR)

☐ **Provide the capability to store, retrieve, modify and delete schedule request building blocks:**

  – Prototypes

  – Patterns – set of schedule request prototypes

☐ **Provide the capability to generate a series of SARs and associated ASARs based on TSW information, and controlled by a user-defined pattern.**

- ☐ Provide the capability to generate a series of RRs based on confirmed events, TSW information, and TDRSS Unscheduled Time (TUT) information, and controlled by a user-defined pattern.

- ☐ Provide the capability of accepting and processing externally generated (batch) schedule requests.

- ☐ Provide the capability to interactively create a new schedule request by copying and editing a previous request.

- ☐ Through the SNAS Graphical User Interface (GUI), provide the ability to view, manipulate, and edit scheduling information (graphical and/or textual information, displayed individually or simultaneously).

- ☐ Allow the customer to view a report of the schedule requests generated and status.

- [] Format and store the request(s) following customer's entry or import.

- [] Provide the capability to select a stored individual schedule request or a stored group of schedule requests to transmit to the NCCDS.

- [] All options specified for the type of request by the 451-ICD-NCCDS/MOC will be available.

- [] Provide the capability to import files of TSWs, format the TSWs into valid TSW messages, and transmit them to the NCCDS.

- [] Retrieve current TUT information from the NCCDS and store it so that it is accessible to Internet and Open IONet SNAS customers (TUT information is already accessible to Closed IONet customers).

NCCDS Functionality – Schedule Results

- **Upon receipt of a Schedule Results Message (SRM) from the NCCDS, SNAS will:**
  - Use the result and explanation codes from the SRM to update the status information for the request or event referenced by the SRM.
  - Provide the customer with the capability to review the requests or events with the updated status information.

- **Upon receipt of a User Schedule Message (USM) from the NCCDS, SNAS will:**
  - Use the USM to update the SNAS's schedule.

- **The SNAS will provide the customer with capability to store in a file on the Client workstation the current active events and previously transmitted schedule requests.**

☐ **Provide the customer with the capability to enter Ground Control Message Requests (GCMRs) and transmit them to the NCCDS.**

☐ **Provide the capability to use all options described and format as specified in 451-ICD-NCCDS/MOC.**

☐ **Upon receipt of a GCM Status Message, notify the customer that the GCM Status Message has been received, and show whether the status message indicates that a GCMR was rejected by the NCCDS, reflected by WSC, or accepted by WSC.**

☐ **Upon receipt of a GCM Disposition Message, notify the customer that the GCM Disposition Message has been received, and show whether the message indicates that a reconfiguration request was acknowledged or not acknowledged by WSC.**

☐ **User Performance Data (UPD) Messages:**

- For each TDRS, SNAS is capable of receiving one UPD message every five seconds for each SNAS customer with an active service on the TDRS.

- Upon receipt of a UPD message, SNAS will verify that it applies to a SIC for which there is a logged-in SNAS customer and make the information from the UPD message available for presentation to that customer in real time.

☐ **Return Channel Time Delay Messages (RCTDM):**

- Upon receipt of a RCTD message, SNAS will verify that it applies to a SIC for which there is a logged-in SNAS customer and notify the customer of the receipt of the RCTD message.

- Store the RCTD message in a file on the Client Workstation such that it is available for later processing by customer applications.

□ **Time Transfer Messages (TTM):**

- Upon receipt of a TTM, SNAS will verify that it applies to a SIC for which there is a logged-in SNAS customer and notify the customer of the receipt of the TTM.

- Store the TTM in a file on the Client Workstation such that it is available for later processing by customer applications.

□ **Acquisition Failure Notification (AFN) Messages:**

- Upon receipt of an AFN, SNAS will verify that it applies to a SIC for which there is a logged-in SNAS customer and notify the customer of the receipt of the AFN.

☐ **Based on the customer's login information, SNAS will provide the customer with the capability to select the SIC to be used in vectors from a list of SICs for which the customer is authorized.**

☐ **Entry/Conversion/Storage Capabilities:**

- Enter the latitude, longitude, and altitude of a customer spacecraft.

- Enter the Cartesian position and velocity of a customer spacecraft.

- Convert a customer-entered set of latitude, longitude, and altitude data for a customer spacecraft into a type 8 (stationary) Improved Interrange Vector (IIRV) for that spacecraft.

- Convert a customer-entered set of latitude, longitude, and altitude data for a customer spacecraft into a type 1 (orbital) spacecraft vector.

- Directly enter IIRVs.

- Import files of IIRVs manually and/or automatically.

- Select one or more IIRVs for transmission to the NCCDS.

- Display previously transmitted IIRVs.

DAS Functionality

☐ **Provide the capability to interface with the DAS to perform the following functions related to SN DAS services:**

– Service Planning: Request a report on the resource allocations available to the customer.

– Service Allocation: Provide the capability to request the following:

- Allocation of a specified resource

- Deletion of a pending or ongoing resource allocation

- Modification of a pending resource allocation

- A list of all currently planned events for the customer

- The details of a specified planned event

– Real-Time Operations: Provide the capability to submit reconfiguration and reacquisition requests.

– Service Performance Monitoring:

- If customer performance data is enabled, SNAS will provide this data to the customer as it is received from the DAS.

- Capable of receiving one DAS user performance data message per minute for each active service with ongoing DAS support.

- For each TDRS, SNAS is capable of receiving one UPD message each sixty seconds for each SNAS customer with an active service on the TDRS.

- Upon receipt of a UPD message, SNAS will verify that it applies to a SIC from which there is a logged-in SNAS customer and make the information from the UPD message available for presentation to that customer in real time.

– Data Retrieval: A customer can request and receive:

- A search for archived data within a specified time window

- Playback of specific archived data

- Deletion of a previously playback request

- Modification of a previously playback request

DAS Functionality (continued)

- – Customer State Vector Updates:
    - Upon receipt of the response from the DAS, SNAS will notify the customer and make the response available for review.
    - See slide on NCCDS Functionality Vector Storage and Transmission.
- – Receipt of DAS Alerts:
    - Upon receipt of a DAS alert, the SNAS will notify the customer implied by the SIC specified in the DAS alert message and makes the text of the DAS alert message available for review by the customer.
    - If the DAS alert message does not apply to a specific user (i.e., SIC = "0000"), the SNAS will notify all customers and make the text of the DAS alert message available for review by all customers.

☐ **Management capabilities:**

- Data entry, deletion, update, and display.
- Create, modify, and display data forms and reports.
- Make queries, examine data in either form, or file formats.
- Store both static and dynamic data.
- Import data from removable media.
- Export data to removable media.
- Backup the entire SNAS database.
- Restore the entire SNAS database.
- Deposit and query data under the limited/indirect control of SNAS client users.
- Deposit and query data under the full/direct control of SNAS administrative personnel from the SNAS servers.
- Automatically purge data based on criteria specified by SNAS administrative personnel.
- Delete data under the direct control of SNAS administrative personnel from the SNAS servers.

☐ **SN Service Data:**

– Provide the capability to store and retain requests sent to the NCCDS and to the DAS.

– For each SIC, partition data such that some of the data for that SIC can be entered, deleted, or modified only by authorized SNAS administrative personnel while the remainder of the data for that SIC can be entered, deleted, ore modified by SNAS client users authorized for the SIC.

– Privileges related to entry, deletion, or modification of relatively static data such as service specification codes (SSCs) are restricted to authorized SNAS administrative personnel while privileges related to entry, deletion, or modification of time-dependent data such as schedule requests is restricted to SNAS client users.

– Automatically purge data related to SN services based on criteria specified by authorized SNAS administrative personnel.

– Provide SNAS client users with the capability to access the contents of client log files containing data for which the user is authorized.

Database Functionality – General (continued)

☐ **Customer Data:**

- For each SIC supported by the SNAS, provide authorized SNAS administrative personnel with the capability to create and maintain all customer data necessary to interact with the NCCDS/DAS.

- For each SIC, is capable of retaining a minimum of 10 SSCs.

- Maintain a list of valid SUPIDENs for each SIC.

- Provide the customer with the capability to review and reference this data in the process of entering requests.

☐ **Provide the capability to log and delog:**

- – Incoming external messages

- – Outgoing external messages

- – Alerts sent to SNAS clients

- – Records pertaining to the establishment and termination of communications connections

- – Records pertaining to SNAS system failures, database failures, successful SNAS login attempts, rejected SNAS login attempts

☐ **Provide administrative personnel the capability to selectively control the logging and delogging of all of the above.**

☐ **Provide client users with the capability to selectively control delogging of all of the above data for which the user is authorized.**

Performance Requirements

□ **Provide the capability to store data for a minimum of 100 customer platforms.**

□ **Allow for one set of operational data and for at least one set of test data for each platform.**

□ **For any combination of Internet, Open IONet, and Closed IONet clients, provide the capability of supporting simultaneous connections from SNAS clients.**

□ **Actual SNAS response times depend on factors that are beyond the control of the SNAS product. Response time characteristics:**

– For interactions initiated from the SNAS client and requiring a response from the NCCDS or DAS, the SNAS response time from the perspective of the client is not more than 10 seconds greater than the NCCDS or DAS response time from the perspective of the SNAS Closed server.

– For interactions initiated from the SNAS client and requiring simple retrieval of data from the SNAS database, the SNAS response time from the perspective of the SNAS client is not greater than 10 seconds (Note: "Simple retrieval" applies to an action such as retrieving a single scheduled SN event. It does not apply to a complex action such as retrieval of an entire schedule).

Section 5
Security

Security

☐ **Compliant with:**

- NPG 2810.1, Security of Information Technology
- GPG 2810.1, Security of Information Technology
- 290-003, IONet Security Plan
- 290-004, IONet Access Protection Policy and Requirements
- WSC DSMC Security Plan

☐ **SNAS Security Model:**

- Capable of performing certificate authentication between a certificate authority (CA), user certificate, and application certificates.
- Provides a framework for:
  - Authentication
  - Data privacy
  - Data integrity
  - Non-repudiation of missions that use NASA's TDRSS services

Section 6
Operations and Maintenance

- ☐ **Capable of continuous unattended operation.**

- ☐ **Capable of supporting routine maintenance and system administrative functions without rendering SNAS operationally unavailable to clients.**

- ☐ **Capable of operating using power and cooling available in the DSMC.**

- ☐ **RMA requirements:**
  - Mean Time to Repair (MTTR): Not to exceed 60 minutes
  - Individual SNAS server inherent availability: 0.9998 (for any 10,000-hour period)
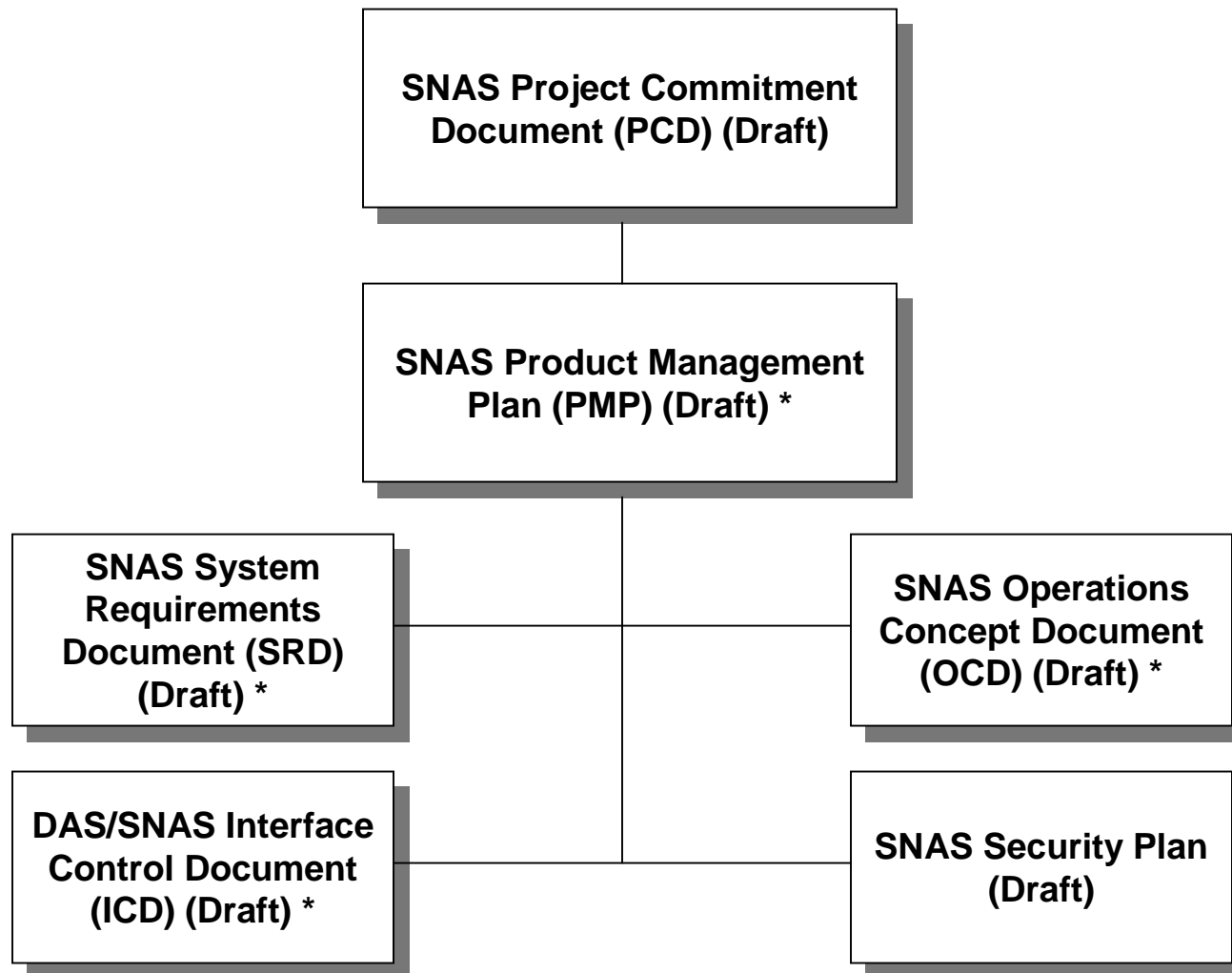 - SNAS operational availability: 0.9999 (for any 10,000-hour period)

Section 7
Documentation

SNAS Product Documentation

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        ┌─────────────────────────────┐
        │   SNAS Project Commitment   │
        │    Document (PCD) (Draft)   │
        └──────────────┬──────────────┘
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        ┌──────────────┴──────────────┐
        │   SNAS Product Management    │
        │    Plan (PMP) (Draft) *     │
        └──────────────┬──────────────┘
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   ┌───────────────────┼───────────────────┐
   │                   │                   │
┌──┴──────────────┐    │    ┌──────────────┴──┐
│  SNAS System    │    │    │ SNAS Operations │
│  Requirements   │────┤    │ Concept Document│
│ Document (SRD)  │    │    │  (OCD) (Draft) *│
│   (Draft) *     │    │    └──────────────┬──┘
└──┬──────────────┘    │                   │
   │                   │                   │
┌──┴──────────────┐    │    ┌──────────────┴──┐
│ DAS/SNAS Interface │  │   │ SNAS Security Plan│
│ Control Document │──┴───│     (Draft)      │
│  (ICD) (Draft) * │       └─────────────────┘
└─────────────────┘
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SNAS Project Commitment Document (PCD) (Draft)

*SNAS Product Management Plan (PMP) (Draft) ***

*SNAS System Requirements Document (SRD) (Draft) ***

*SNAS Operations Concept Document (OCD) (Draft) ***

*DAS/SNAS Interface Control Document (ICD) (Draft) ***

SNAS Security Plan (Draft)

* Document is available for review on the SNAS Web Site: http://snas.gsfc.nasa.gov

Section 8
Product Implementation

Implementation Contractor
Schedule
Risk Mitigation

Implementation Contractor

☐ **Implementation contractor organization will be the the Near Earth Networks Services (NENS) contractor team.**

☐ **Implementation by NENS will begin in January 2004.**

☐ **Implementation contractor requirements are documented in Section 10 (Acquisition Summary) of the SNAS PMP.**

 – Contractor product management, CM, and QA requirements

 – Required deliverables

 – Review and reporting requirements

Schedule

- **Preliminary Design Phase**   **October 2003 – January 2004**
- **Preliminary Design Review (PDR)**   **14 January 2004**
- **Implementation Contractor Start**   **January 2004**
- **Subsystem Requirement Development**
  and Detailed Design   **January – March 2004**
- **Critical Design Review (CDR)**   **17 March 2004**
- **Development:**
  - Code and Test   March 2004 – March 2005
  - System Testing   April – June 2005
- **Shipment and Installation**   **June – July 2005**
- **Test Readiness Review (TRR)**   **15 July 2005**
- **Final Acceptance Testing**   **July – August 2005**
- **Training and Documentation Close-out**   **September 2005**
- **Operations Readiness Review (ORR)**   **5 October 2005**
- **Transition SN Customers to**
  SNAS Operations   **October – December 2005**

- ☐ *Risk:* SNAS Interface Testing with DAS

- ☐ *Impact:* A potential resource conflict exists between DAS customers and the SNAS development team. Both may desire to utilize the DAS Testbed for interface testing at the same time.

- ☐ *Level:* High

- ☐ *Mitigation:* SNAS verification planning will factor in at the earliest possible time the SN customer utilization schedule of the DAS Testbed. Coordination with the WSC O&M personnel managing the DAS Testbed will be conducted to minimize the possibility of schedule conflicts with DAS customers who wish to conduct testing with the Testbed.

- *Risk:* SN Customer Transition from UPS and SWSI to SNAS

- *Impact:* An ineffective transition from UPS and SWSI to SNAS could potentially impact SN customer service support.

- *Level:* Low

- *Mitigation:* A period of time for transitioning SN customers from UPS and SWSI to SNAS has been provided in the schedule. The SNAS system engineering support contractor will develop a plan early during SNAS development to facilitate a smooth transition.

☐ *Risk:* **Port of SWSI High Availability Applications from Sun Hardware to Linux-based Hardware**

☐ *Impact:* **Linux-based servers are being considered for SNAS to reduce maintenance costs. An inability of this type of workstation to support the high availability applications currently on SWSI could impact SNAS reliability and availability.**

☐ *Level:* **Low**

☐ *Mitigation:* **This issue will be explored early in the SNAS design phase. A study and/or lab prototype will be conducted to determine a Linux-based system's capability to support high availability applications.**

Section 9
Closing Remarks

Closing Remarks

- □ **Next Steps:**
  - – Begin preliminary design phase in October 2003.
  - – SNAS Preliminary Design Review in January 2004.
  - – NENS implementation contractor start in January 2004.
- □ **SNAS Web Site: http://snas.gsfc.nasa.gov**
- □ **Requests for Action (RFA) Review**